Achieving Sustainable Growth Through Business Productivity Optimization

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Sustainable Solutions

March 19, 2012
Sustainability Contact – The DuPont Bradley curve

- Natural Instinct
- Compliance is the Goal
- Delegated to Manager
- Lack of Management Involvement

- Management Commitment
- Condition of Employment
- Fear/Discipline
- Rules/Procedures
- Supervisor Control, Emphasis, and Goals
- Value All People
- Training

- Personal Knowledge, Commitment, & Standards
- Internalization
- Personal Value
- Care for Self
- Practice, Habits
- Individual Recognition

- Help Others Conform
- Others’ Keeper
- Networking Contributor
- Care for Others
- Organizational Pride

Organization cultural maturity

Productivity, Quality, Profitability, Safety Issues

Reactive

Dependent

Independent

Interdependent

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Topics

• The Drivers for Sustainability
• DuPont Sustainability Journey
• The Roadmap to Sustainable Growth
• Sustainable Operations: The DuPont Production System
• DuPont Sustainable Solutions
The Drivers for Sustainability
Prime Minister of Malaysia driving sustainable growth...

- BBC May 19, 2011: ‘Prime Minister Najib Razak wants to wave goodbye to "business-as-usual" growth

- Kuala Lumpur May 17, 2011: The Malaysian Prime Minister announced the launching of an ambitious plan to build a "green economy" in Malaysia with the help of an international advisory council that includes an impressive cast-list*

- The initiative is part of economic reforms instituted by Prime Minister Najib Razak aimed at pushing the Southeast Asian country towards developed-nation status by 2020.

Including Jeffrey Sachs, special advisor to UN Secretary-General Ban Ki-moon; Rita Colwell, former head of the US National Science Foundation; Nobel Medicine laureate Richard Roberts, currently chief scientific office with New England Biolabs; and Kiyoshi Kurokawa, former science advisor to the Japanese prime minister. YBhg Dato’ Shamsul Azhar Abbas

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External “Drivers” for companies to be more sustainable

1. Resource costs
   - Volatility, magnitude and escalation of raw materials costs and energy are increasing the urgency to drive improvements in efficiency and productivity.

2. Public policy
   - Governments and global institutions are introducing new environmental and energy management regulations and policies, pressuring companies & societies into action.

3. Access to capital
   - The Investment community is increasing the scrutiny on a company’s sustainability performance and capabilities when making investment choices.

4. Public accountability
   - Companies are expected to publish sustainability improvement goals and are being held accountable for delivering results.

5. Competition
   - Sustainability is being used as a powerful strategy to lower the cost of goods and attract customers at every level globally.

# Sustainability Challenges Across different sectors

<table>
<thead>
<tr>
<th>Key End Markets</th>
<th>Industry challenges</th>
<th>Sustainability challenges</th>
</tr>
</thead>
</table>
| **Energy (Oil & Gas, Power)** | - Exploitation of unconventional resources  
- Resource nationalization and growth of NOCs  
- Shift in global wealth distribution  
- Adapt grid to intermittent renewables and new uses of electricity (e.g., for electric cars)  
- Increase access to electricity | - Climate change / carbon risk  
- Smart energy  
- Low-carbon / renewable energy  
- EHS excellence  
- Socio-economic impact of activities |
| **Chemicals**           | - Increasing and more stringent regulations  
- Increasing prices of raw materials  
- Shifting production and demand between geographies and segments | - EHS excellence  
- Sustainable product portfolio  
- Sustainable supply chain  
- Product regulation |
| **Mining & Metals Processing** | - Decreasing quality of ore fields leads and increasing exploitation difficulties lead to lower margins  
- Increasing regulations | - EHS management  
- Climate change and carbon regulation  
- Land use and claims  
- Social development in rural area  
- Human rights  
- Clean technologies |
| **Transportation (Rail, Aviation, Infrastructure)** | - Increased travel demand and changing behaviors  
- Fuel availability and price  
- Aging transportation infrastructures | - Climate change  
- Carbon regulation  
- Impact of infrastructure |
Global players consider Sustainability as a prerequisite for business success driving them to a clear positioning to capture the benefits, for existing and future assets.


...Achieving Sustainable Growth Through Business Productivity Optimization

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DuPont Sustainability Journey
The Mission of DuPont

SUSTAINABLE GROWTH

The creation of shareholder and societal value while we reduce the environmental footprint* along the value chains in which we operate.

* DuPont defines “footprint” as all injuries, illnesses, incidents, waste, emissions, use of water and depletable forms of raw materials and energy.
Achieving Sustainable Growth Through Business Productivity Optimization

Journey Toward Sustainable Growth

Based on a foundation of environmental stewardship

CEO Ed Woolard takes a stand, 1989

Footprint Reduction Goals
- Toxic air emissions: 70%
- Air carcinogens: 90%
- GHG emissions: 40%
- Hazardous waste: 35%

Actual Reductions by 2000
- Toxic air emissions: 75%
- Air carcinogens: 92%
- GHG emissions: 55%
- Hazardous waste: 46%

Business Integration

Value


Compliance

Corporate Environmentalism

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Journey Toward Sustainable Growth

*Based on a foundation of environmental stewardship*

- Compliance
- Corporate Environmentalism
- Footprint Reduction Goals
- Energy Goals
- Market-facing Goals
- Sustainable Growth
- Sustainable Growth Mission
- CEO Chad Holliday, Sustainable Growth Mission
- CEO Ed Woolard takes a stand, 1989
So far, DuPont has achieved a significant footprint reduction

Cost savings: **Over $6 Billion (USD)**
Industry recognition: “Laggard” to “Leader”
427th consecutive quarter dividend

Sources:
- DuPont Global Reporting Initiative (GRI) report:
- DuPont Sustainability Progress Report:
We are also on track to deliver on our 2015 Footprint and Market Facing Goals

Reducing Environmental Footprint

- Greenhouse Gas Emissions > 14.62 MM metric tCO2eq
- Water Conservation > 32 billion gallons
- Fleet Fuel Efficiency > 100% leading tech vehicle
- Air Carcinogens > 0.9 million pounds
- Independent Verification of Site Programs > 100% site

Serving the Marketplace

- Environmentally Smart Market Opportunities from R&D Efforts > 640 MM$
- Products that Reduce Greenhouse Gas Emissions > 2 Billion $ revenues
- Revenues from Non-Depletable Resources > 8 Bilions $ revenues
- Products that Protect People > 1,000 products

DuPont Sustainability Progress Report:
The Roadmap to Sustainability
In the early 90’s, Chad Holliday, DuPont CEO’s at that time, identified the critical success factors for sustainable growth

1. Vision Clearly Defined by Leadership at the Top
2. An Implementer
3. Set Public Goals/Metrics so Everyone has Something to Measure Progress Against
4. Organizational Engagement and Culture Transformation
5. Corporate Sustainability Planning Process – Fully Integrated with Strategic Business Planning Process
6. Implementation Excellence
7. Recognize Key Programs & Accomplishments
8. Form External Relationships with Key Stakeholders
Success depends on the ability to integrate and execute the following sustainability roadmap

**5 STEPS**

1. Build the business case for sustainability
2. Understand the impact of the key drivers
3. Integrate sustainability in the ambition, strategy and objectives
4. Manage risks, reduce costs and build stakeholder's value
5. Develop competencies and support cultural change

**BENEFITS**

- Optimal allocation of resources to ensure the highest return on sustainability investments
- Accelerated progress towards sustainability goals
- Reduced corporate sustainability risks
- Increased organizational alignment, clarity, and operational discipline
- Increased national and international recognition, reputation and interest level for investors
1. Build the business case for sustainability, identifying and quantifying its tangible and intangible value

...for all the company stakeholders.

...generating tangible & intangible value...

...looking at pragmatic actions that can unlock value for the organization...

A sustainability business case is grounded in products, processes and footprint...

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18
2. Understand the impacts of the key external drivers on the company and combine them with the company ambition to be sustainable

Key external drivers for strategic positioning

- **Stakeholder expectations**
  What do stakeholders expect from your company regarding sustainability related issues?

- **Cost/benefit**
  What is the potential social and environmental impact reduction and which actions improve your business value?

- **Regulation**
  How are regulations influencing your business now and in the future?

- **Competition**
  How is the current sustainability performance of the industry and what are the best practices?

- **Technology**
  What technology can help you reduce your social and environmental impact across the regions and value chain?

- **Your own ambition**
  To what extend do you want to match/exceed stakeholders expectations?
3. Set the ambition and integrate sustainability into the business vision, strategy and objectives of the company.
4. Implement an integrated sustainability management system to manage risks, create options, reduce costs, and build stakeholder’s value; measure and communicate the performances externally.
Sustain the results in your operations: develop competencies and drive cultural change with the appropriate organizational structure and management processes to “operationalize” sustainability.

- **Commitment**
- **Policies & principles**
- **Performance**
- **Goals & plans**

- **Supportive staff**
- **Accountability**
- **Integrated structure**
- **Performance & motivation**

- **Management Best practices**
- **Communication processes**
- **Training & development**
- **Learnings, Audits & re-evaluation**

**People Management Culture**

**Strong Leadership**

**Appropriate Organizational Structure**

**Systems Processes and Actions**
Sustainable Operations:
The DuPont Production System
### DuPont Integrated Operations Worldwide

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Supply Chains</td>
<td>80</td>
<td>90</td>
<td>100</td>
<td>110</td>
<td>120</td>
</tr>
<tr>
<td>Plant sites</td>
<td></td>
<td></td>
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<tr>
<td>Warehouses</td>
<td></td>
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<tr>
<td>Shipping</td>
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<tr>
<td>Employees (approx.)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Countries</td>
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<tr>
<td>Contract operations</td>
<td></td>
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<tr>
<td>New Product Launches</td>
<td></td>
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<tr>
<td>NPS “Avg Annual Imp”</td>
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<td></td>
</tr>
<tr>
<td>Annual Gross Productivity</td>
<td></td>
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</tr>
</tbody>
</table>

- Global Supply Chains: 117
- Plant sites: 239 Sites
- Warehouses: 450+
- Shipping: Major Container user
- Employees (approx.): 38,000+
- Countries: 45
- Contract operations: 1000+ Sites
- New Product Launches: 5%-25%
- NPS “Avg Annual Imp”: 2%-3%
- Annual Gross Productivity: > $1B per year PTOI

### Diverse Operations
- Seeds
- Discrete Parts
- Food Additives
- Industrial Biotech
- Paint production
- Film production
- Polymer Production
- Fiber production
- Consumer goods
- Electronic materials
- Continuous chemical process
- Fine and custom chemicals
- Fluorine Chemicals

### DuPont Sustainable Solutions

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7/10/2013

Achieving Sustainable Growth Through Business Productivity Optimization
DuPont Operations: From Continuous Improvement Journey to Transformational Change

Initiatives have had a variety of effectiveness and impact!
Need for Step Change Improvement

Top manufacturing companies

TOP QUARTILE Performers

Gap to top quartile

Time

2006 2010

Relative Competitiveness

DuPont Operations

Top manufacturing companies

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### June / December 2006 – The size of the prize

<table>
<thead>
<tr>
<th>Category</th>
<th>Spend/basis $ millions</th>
<th>Opportunity range</th>
<th>Prize $ millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-energy raws (yields, waste)</td>
<td>11,000</td>
<td>1%-2%</td>
<td>100-200</td>
</tr>
<tr>
<td>Energy</td>
<td>1,100</td>
<td>5%-7%</td>
<td>50-100</td>
</tr>
<tr>
<td>Other variable costs</td>
<td>1,800</td>
<td>~1%</td>
<td>20</td>
</tr>
<tr>
<td>Fixed costs ex Maintenance</td>
<td>4,000</td>
<td>7.5%-15%</td>
<td>400-600</td>
</tr>
<tr>
<td>Maintenance ex materials</td>
<td>540</td>
<td>10%-20%</td>
<td>50-100</td>
</tr>
<tr>
<td>Turnaround maintenance – Uptime</td>
<td>330</td>
<td>2.5%-10%</td>
<td>10-40</td>
</tr>
<tr>
<td>Uptime (capacity release)</td>
<td>29,000</td>
<td>1%-2%</td>
<td>300-600</td>
</tr>
<tr>
<td>Maintenance materials</td>
<td>200</td>
<td>7.5%-15%</td>
<td>15-30</td>
</tr>
<tr>
<td>Raw materials procurement</td>
<td>11,000</td>
<td>tbd</td>
<td>tbd</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>900-1,700+</strong></td>
<td></td>
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</tbody>
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Sustainable Operations: The DuPont Production System

Current and future requirements for capability and performance

Focus on what really matters, with the right people

The right tools and practices to solve root level problems

The right skills and coaching

People instinctively doing the right things

An integrated management system that fully develops people and organizational capability for effectiveness and creativity in utilizing assets and eliminating all waste.

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7/10/2013
## Sustainable Results

### Continuous Improvement Validated Benefits

<table>
<thead>
<tr>
<th></th>
<th>DPS Deployment across all Regions and SBU’s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007</td>
</tr>
<tr>
<td>Small Sites</td>
<td>0</td>
</tr>
<tr>
<td>Large Sites</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Cost</td>
<td>335</td>
<td>209</td>
<td>505</td>
<td>275</td>
<td>200</td>
</tr>
<tr>
<td>Variable Cost</td>
<td>165</td>
<td>397</td>
<td>652</td>
<td>460</td>
<td>350</td>
</tr>
<tr>
<td>Capacity Release</td>
<td>25</td>
<td>200</td>
<td>83</td>
<td>410</td>
<td>300</td>
</tr>
<tr>
<td>Total</td>
<td>525</td>
<td>621</td>
<td>1240</td>
<td>1100</td>
<td>850</td>
</tr>
<tr>
<td>Working Capital</td>
<td>401</td>
<td>412</td>
<td>997</td>
<td>430</td>
<td>375</td>
</tr>
</tbody>
</table>

*Cumulative improvements of more than USD 5 billion (much more than initial estimate)*
A production system implementation is the shortest and most robust way to success towards sustainable, world-class operations

- 3-5 years transformational journey
- ROI/NPV drives the approach, to “pay-as-you-go”, which builds business leadership support
- Cultural change enables sustainable results
- The focus on operation transformation and integration of supply chain is critical to deliver full value to the client
DuPont Sustainable Solutions
DuPont Sustainable Solutions

- Safer Workplace
- Protecting the Environment
- Increased Productivity
- Reduced Footprint
- Enabled Workforce

- Employee Safety
- MECS Sulfuric Acid Technology
- Environmental Management
- eLearning Systems

- Contractor Safety
- BELCO® Scrubbing Technology
- STRATCO® Alkylation
- Energy Efficiency
- Instructor Led Training

- Process Safety
- IsoTherming® Hydroprocessing

- Sustainable Assets
- Media Tools

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DuPont Sustainable Solutions brings value to our clients

Improving the Management of Risk
Improving Profitability
Improving Sustainability
Our unique proposition is to leverage DuPont owner operator experience and enabling our client to “operationalize” sustainability

As an owner we know that transformational changes are not only driven by:

- Strategy,
- Or Management Systems,
- Or Technical Solutions…
- Or Capabilities Development,
- Or Organisational Design…

…but by integration of the above, following a structured roadmap, building capabilities, and enabling cultural change to drive sustainable results from your operations
Minimizing the risks and extracting the maximum value from an integrated operations system

FROM
- Experts
- Initiatives & projects
- Slower, non-sustainable
- Higher risks
- Dependent culture
- Stove-pipe structure
- Push

TO
- Everybody on the shop floor
- Capability development
- Faster and sustainable
- Lower risks
- Interdependent culture
- Integrated architecture
- Pull

Unlock Value of Assets (people, Materials, Investment)

Risks & Footprint reduction
- Capacity release
- Debottlenecking
- Supply chain improvement
- Cost productivity

Innovation and Future business results

Sustainable Results

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Achieving Sustainable Growth Through Business Productivity Optimization
Client Case: Designing & implementing an Integrated Production System that enables transformation towards world-class operational performance

### Client’s needs
- Company performance improvement
- Integrated approach to operations management: operations systems and procedures, management processes, people capabilities mindsets and culture.

### Key questions & Approach

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Leadership Alignment &amp; Commitment</td>
</tr>
<tr>
<td>2</td>
<td>Production System Design</td>
</tr>
<tr>
<td>3</td>
<td>Integrated Production System</td>
</tr>
</tbody>
</table>

#### Leadership Alignment & Commitment
- Develop executive leadership alignment around operational objectives with the intent to determine top-to-bottom commitment to continually improving operations efficiency
- Establish long-term operational goals
- Establish case for change

#### Production System Design
- Management Process
- Culture Transformation
- Capability Building
- Diagnose & Improvement Tools
  - Operations
  - Energy
  - M&R
  - Lean Manufacturing Technology
  - Safety

#### Integrated Production System
- Implementation of the system site-per-site
- Structured approach: diagnose, implement, sustain
- Focusing early on value release, optimizing existing activities in the process.
- Leadership, teamwork and problem solving empowering employees, driving culture change

### Benefits
- A sustainable roadmap with significant year-on-year payback that enables to deliver the business objectives
- Very significant contribution to the bottom line ($1B, or up to 20% of operating costs)
- World-Class Operational Practices and Culture in 4-5 years